SOME RESULTS CONCERNING THE EXPECTED COST OF A SORTING PROCEDURE

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1. ABSTRACT

The classical screening procedures assume a joint distribution for screening or sorting variables X and a criterion variable Y. Most of the cases considered in the literature assume a joint normal population.

The loss should increase, the further the Y is above or below the values of those in the correct category. We first consider a squared error loss function which can also be adapted to measuring distance from a lower percentile in the top category. Then, we introduce a new type of loss function. It depends on a stress-strength formulation where items assigned to the top grade are exposed to a random stress that is stochastically larger than the random stress applied to items assigned to a lower grade. Costs of failure are also included.

We derive some general expressions for the expected loss of any sorting procedure and then give a few special results for bivariate normal distributions and for a bivariate Weibull distribution.